Systems Controls & Instruments (UK) Ltd.
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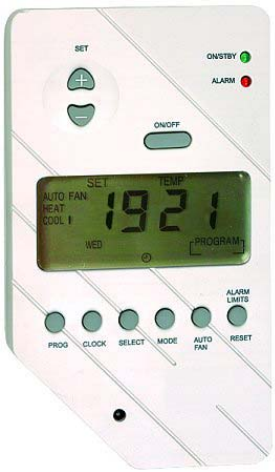
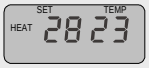
CTR – Owner's Manual



Normal Display

In normal display, the LCD alternates between a Real Time Clock and Set & Room Temperatures.

Real time clock



Set & Room temperatures

Real Time Clock

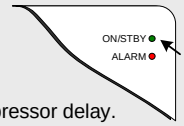
- Press the CLOCK button – the hours will flash.
- Using the (+) and (-) buttons adjust the hours.

- Press the CLOCK button again – the minutes will flash.
- Using the (+) and (-) buttons adjust the minutes.

- Press the CLOCK button – the day will flash.
- Using the (+) and (-) buttons adjust the day.

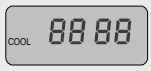
On/Off – Green LED

- Press the ON/OFF button to turn the thermostat ON or OFF.
- When the thermostat is ON, the green LED (ON/STBY) is turned ON.
- The Green LED will flash during the 4 minutes compressor delay.

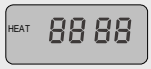


Mode

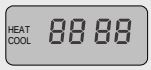
- Press the MODE button to switch between:
  - COOL



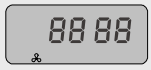
  - HEAT



  - AUTO CHANGE-OVER
    The active mode will flash.

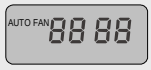


  - FAN ONLY

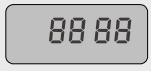


Auto Fan

- Press the AUTO FAN button to turn the AUTO FAN function ON or OFF.
  - AUTO FAN ON
    The fan will work only when there is demand for cooling or heating.



  - AUTO FAN OFF
    The fan will work continuously.



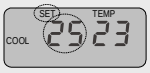
The AUTO FAN function is not available when the thermostat is in FAN ONLY mode.

In Oil systems, in heating mode, switching the AUTO FAN function ON will turn the fan OFF. (The unit will work without the fan).

Temperature Set-Point

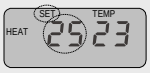
In COOL mode:

- Press the (+) or (-) buttons – "SET" & set-point temperature will flash.
- Using the (+) or (-) buttons adjust the **set-point temperature for cool**.



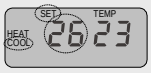
In HEAT mode:

- Press the (+) or (-) buttons – "SET" & set-point temperature will flash.
- Using the (+) or (-) buttons adjust the **set-point temperature for heat**.

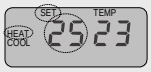


In AUTO CHANGE-OVER mode:

- Press the (+) or (-) buttons – "COOL", "SET" & set-point temperature will flash.
- Using the (+) or (-) buttons adjust the **set-point temperature for cool**.



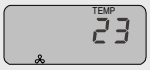
- Wait a few seconds – "HEAT", "SET" & set-point temperature will flash.
- Using the (+) or (-) buttons adjust the **set-point temperature for heat**.



Use the AUTO CHANGE-OVER mode on days when both heating and cooling are necessary.

When the thermostat is working in AUTO CHANGE-OVER mode, it has 2 different set-points, 1 for cool and 1 for heat. The thermostat will automatically keep a safety differential of at least 1 degree between the two set-points (heating set-point is always less than cooling set-point).

In FAN ONLY mode:
The set-point temperature cannot be adjusted in FAN ONLY mode. When pressing the (+) or (-) buttons, the ambient temperature will be displayed.

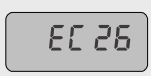


Economy Mode

When the thermostat is set to work in economy mode, it overrides the set-point temperatures given by the user, and uses pre-defined economy set-points.
Use the economy mode when leaving home/office for vacation or when out of town.

Turning economy mode ON

- Turn the thermostat ON
- Press & Hold the AUTO FAN button (5 seconds) – until "EC" appears on display.



Turning economy mode OFF

- Press & Hold the AUTO FAN button (5 seconds) – until the thermostat returns to normal display.

In economy mode, none of the buttons work.

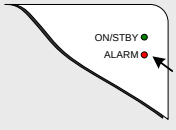
View the Outdoor Temperature

- Press the SELECT button to view the outdoor temp.

The option is available only when an outdoor temperature sensor is connected to the unit.

Reset / Alarm Conditions

- When the ambient temperature rises or drops to a pre-defined alarm limit set by the technician, the red LED will flash and the alarm output will be activated.
- Press & Hold the RESET button (5 seconds) to clear the alarm and call technician.



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CTR – Owner's Manual – Weekly Program

Weekly Program

The thermostat can be programmed with up to 12 different programs: Four different programs for the weekdays (Monday to Friday); Four different programs for Saturday and four different programs for Sunday (The daily programs are numbered 1, 2, 3 & 4).

Setting the program

- Press the PROG button to enter programming – all 4 digits will flash.

→Use the CLOCK button here to quickly switch between Weekdays, Saturday & Sunday.

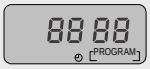
- Press the PROG button again – "PROGRAM 1" & weekdays will appear. the hours will flash.

→Use the CLOCK button here to quickly switch between Programs 1, 2, 3 & 4.

- Using the (+) and (-) buttons adjust the START TIME - HOURS for PROGRAM 1 (weekdays).
- Press the PROG button again - the minutes will flash
- Using the (+) and (-) buttons adjust the START TIME - MINUTES for PROGRAM 1 (weekdays).
- Press the PROG button again – "COOL" and set-point temperature will flash.
- Using the (+) and (-) buttons adjust the SET-POINT TEMPERATURE FOR HEAT .
- Press the PROG button again – "HEAT" and set-point temperature will flash.
- Using the (+) and (-) buttons adjust the SET-POINT TEMPERATURE FOR COOL .
- Press the PROG button again to set PROGRAM 2 and repeat the procedure.

Activate / Deactivate the program

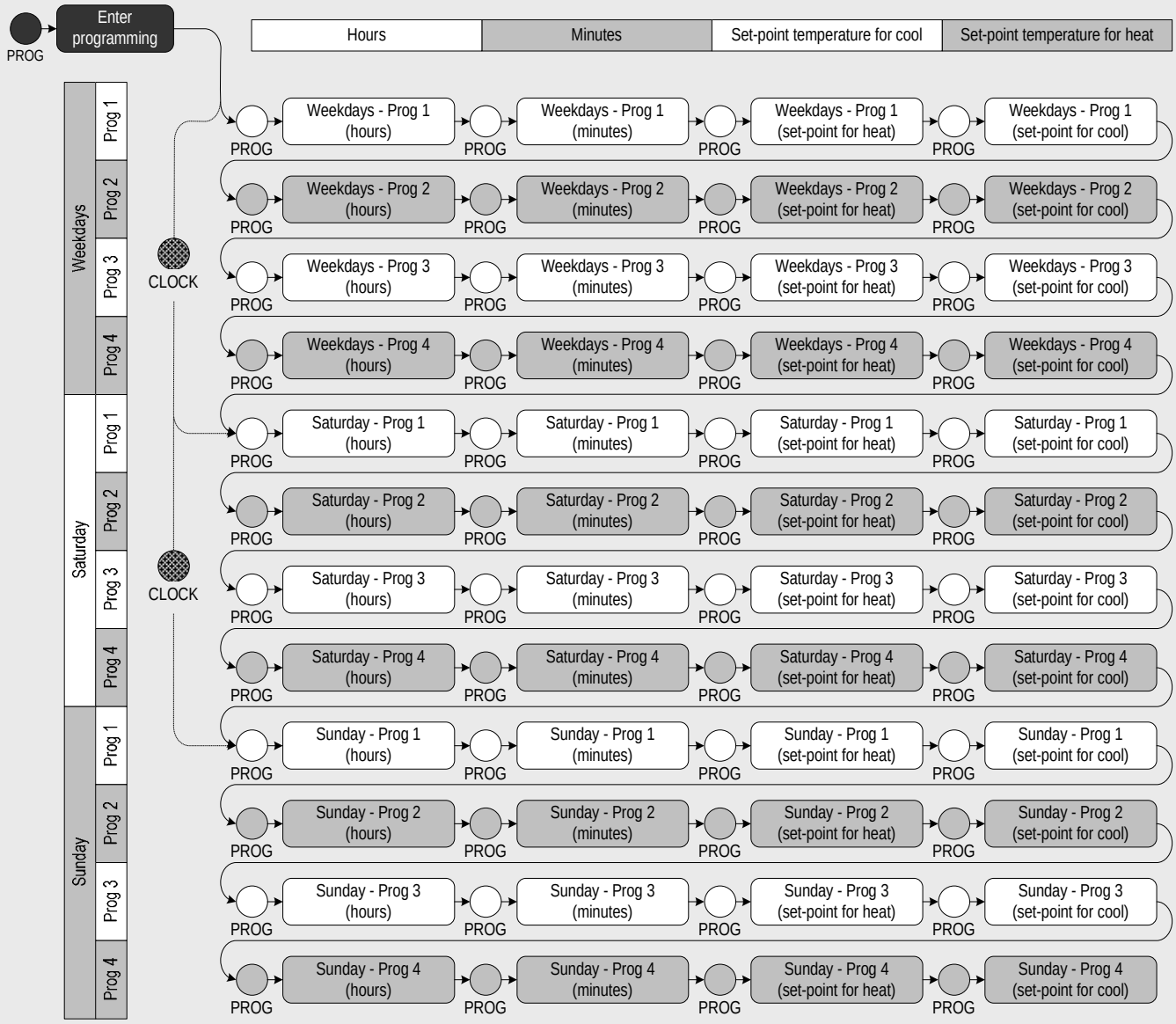
- Press & Hold the PROG button to activate / deactivate the program.
- When the program is active, the word "PROGRAM" and the clock icon will appear on display,



Override the program set-points

- The user can temporarily change the set-point temperature to be different than the set-point temperature specified by the program. This change will be affective until the next event of the program begins.

Program Chart


Enter programming
PROG
Hours
Minutes
Set-point temperature for cool
Set-point temperature for heat
Weekdays
Saturday
Sunday
Prog 1
Prog 2
Prog 3
Prog 4
CLOCK
CLOCK
Weekdays - Prog 1 (hours)
Weekdays - Prog 1 (minutes)
Weekdays - Prog 1 (set-point for heat)
Weekdays - Prog 1 (set-point for cool)
Weekdays - Prog 2 (hours)
Weekdays - Prog 2 (minutes)
Weekdays - Prog 2 (set-point for heat)
Weekdays - Prog 2 (set-point for cool)
Weekdays - Prog 3 (hours)
Weekdays - Prog 3 (minutes)
Weekdays - Prog 3 (set-point for heat)
Weekdays - Prog 3 (set-point for cool)
Weekdays - Prog 4 (hours)
Weekdays - Prog 4 (minutes)
Weekdays - Prog 4 (set-point for heat)
Weekdays - Prog 4 (set-point for cool)
Saturday - Prog 1 (hours)
Saturday - Prog 1 (minutes)
Saturday - Prog 1 (set-point for heat)
Saturday - Prog 1 (set-point for cool)
Saturday - Prog 2 (hours)
Saturday - Prog 2 (minutes)
Saturday - Prog 2 (set-point for heat)
Saturday - Prog 2 (set-point for cool)
Saturday - Prog 3 (hours)
Saturday - Prog 3 (minutes)
Saturday - Prog 3 (set-point for heat)
Saturday - Prog 3 (set-point for cool)
Saturday - Prog 4 (hours)
Saturday - Prog 4 (minutes)
Saturday - Prog 4 (set-point for heat)
Saturday - Prog 4 (set-point for cool)
Sunday - Prog 1 (hours)
Sunday - Prog 1 (minutes)
Sunday - Prog 1 (set-point for heat)
Sunday - Prog 1 (set-point for cool)
Sunday - Prog 2 (hours)
Sunday - Prog 2 (minutes)
Sunday - Prog 2 (set-point for heat)
Sunday - Prog 2 (set-point for cool)
Sunday - Prog 3 (hours)
Sunday - Prog 3 (minutes)
Sunday - Prog 3 (set-point for heat)
Sunday - Prog 3 (set-point for cool)
Sunday - Prog 4 (hours)
Sunday - Prog 4 (minutes)
Sunday - Prog 4 (set-point for heat)
Sunday - Prog 4 (set-point for cool)

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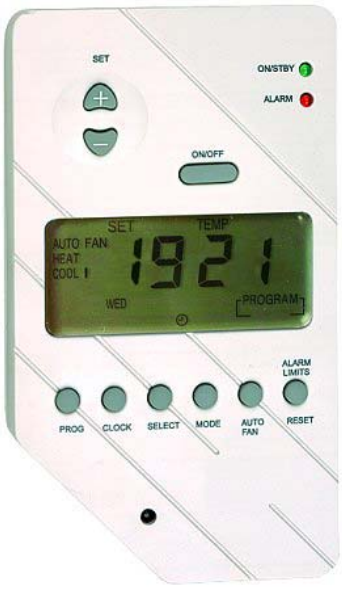
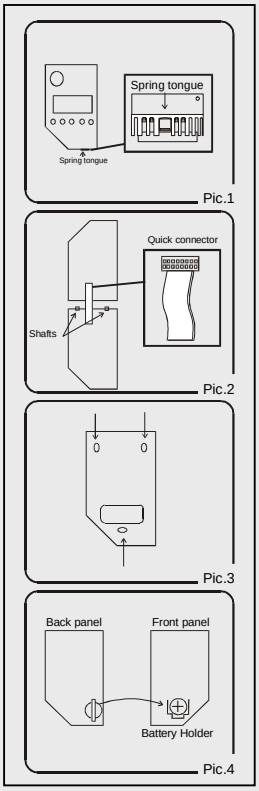


CTR – Technician Settings

Installation Instructions



It is recommended to mount the thermostat between 1.5 & 1.8 meters from the floor where possible.

Separate the base from the cover by pressing the tongue (pic.1).

Gently disconnect the quick connector between cover and base (pic.2)

Line the back panel up against the wall and drill the appropriate fixing holes (pic.3).

Insert screws so they extend approx. 3/16" (3 mm) from the wall. Align the back panel against these screws, pushing it forward, allowing it to slide downwards to lock into position.

Make electrical connections to terminals on the back panel. Refer to the "Wiring Connections" section.

Reconnect the quick connector.

Change the JUMPERS position according to the system configuration. Refer to the "Jumper Configuration" section.

Attach the cover to the base, first the two shafts and then the spring.

Connect 24Vac to the thermostat; verify that LCD display is ON.

Do not install battery before power is applied.

Remove battery from back panel by sliding it to the left and out from its white retaining clip and mount it in black holder on front panel; insert it from the top, gently pressing downwards until it snaps into place and is held under the top clip of the holder.
The '+' engraved on battery should be visible (pic. 4).

Be careful - the top clip of the battery holder is fragile.

Reassemble front and back cover.

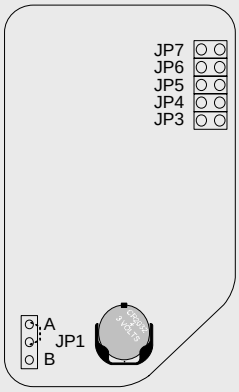
Connect at top first then at bottom .

Wiring Connections

Terminal	Function	HC11	HC22	HC32	HP11	HP22	HP32
T0,T0	Outdoor temperature sensor	OPT	OPT	OPT	OPT	OPT	OPT
T1,T1	External sensor (option)	OPT	OPT	OPT	OPT	OPT	OPT
AUX	Fault input from system	OPT	OPT	OPT	OPT	OPT	OPT
Y1	Compressor 1	+	+	+	+	+	+
Y2	Compressor 2	-	+	+	-	+	+
W1 (B/O**)**	Heat Element 1 / Heat Pump	H.E 1	H.E 1	H.E 1	H.P	H.P	H.P
W2	Heat Element 2	-	+	+	-	-	-
W3	Heat Element 3	-	-	+	-	-	+
G1	Fan	+	+	+	+	+	+
G2	Not in use	-	-	-	-	-	-
AL,AL	Low & High temp. alarm (dry contact)	OPT	OPT	OPT	OPT	OPT	OPT
Rc	24Vac Phase (red)	+	+	+	+	+	+
Rh	24Vac (jumpered to **Rc** terminal)	+	+	+	+	+	+
C	24Vac Common	+	+	+	+	+	+
14,15,16	Another IR Receiver (option)	OPT	OPT	OPT	OPT	OPT	OPT

+ Connect - Not in use H.E 1 Heat element 1 H.P Heat Pump OPT Option

Jumpers Configuration



Disconnect power, remove battery and wait 5 minutes* before changing the jumpers position.

*No need to wait if the unit wasn't connected to power (1st Install).

Important: When changing the jumpers configuration, all information stored in the memory will be lost including the weekly program.

Temperature Sensor	JP1
Internal sensor	A Position
External sensor	B Position

Compressor Delay	JP3
4 minutes delay	OPEN
No delay (for test only !)	SHORT

Clock Mode	JP4
24 Hours	OPEN
12 Hours (AM/PM)	SHORT

Temperature Scale	JP5
Fahrenheit	SHORT
Celsius	OPEN

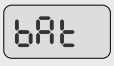
HC / HP Configuration	JP6	JP7
HC Electric	OPEN	OPEN
HC Oil/Gas	OPEN	SHORT
HP energized in COOL	SHORT	OPEN
HP energized in HEAT	SHORT	SHORT

Default from factory Jumper SHORT Jumper OPEN

Replace Battery

Follow these steps to replace the battery:

- Disconnect power.
- Remove existing battery.
- Leave thermostat disconnected for 15 minutes.
- Connect power (without the battery).
- Check if the unit works.
- Gently place the new battery into the holder.
- Test the memory of the thermostat.



Low battery indication

Use only lithium cell 3v battery – CR2032

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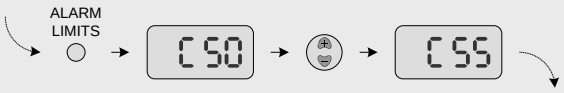
CTR – Technician Settings - Cont'

Temperature Limits, Alarms, Economy mode settings and Offset for calibration of temperature reading.

Entering technician code

- Press the ALARM LIMITS button – "C50" will appear on display.
- Using the (+) button – change the number to "C55".



Adjusting set-point temperature limits for heat and cool

- After changing the code, Press the ALARM LIMITS button – "HL" will appear on display.
- Using the (+) and (-) buttons adjust the set-point temperature limit for heat. (Range 15...35°C, default 35°C)
- Press the ALARM LIMITS button again – "CL" will appear on display.
- Using the (+) and (-) buttons adjust the set-point temperature limit for cool. (Range 10...34°C, default 10°C)

The set-point temperature limit for cool cannot be adjusted higher than the set-point temperature limit for heat.

Adjusting temperature values for high temperature alarm and low temperature alarm

- Press the ALARM LIMITS button again – "HA" will appear on display.
- Using the (+) and (-) buttons adjust the high temperature alarm. (Range 8...46°C, default 40°C)
  (When the room temp. rises above the high temperature alarm, the alarm will be activated.
- Press the ALARM LIMITS button again – "LA" will appear on display.
- Using the (+) and (-) buttons adjust the low temperature alarm. (Range 2...39°C, default 8°C)
  (When the room temp. drops beneath the low temperature alarm, the alarm will be activated.

The low temperature alarm cannot be adjusted higher than the high temperature alarm.

Adjusting set-point temperature limits for heat and cool in economy mode

- Press the ALARM LIMITS button again – "EC" and "COOL" will appear on display.
- Using the (+) and (-) buttons adjust the set-point temperature limit for cool in economy mode. (Range 24...31°C, default 25°C)
- Press the ALARM LIMITS button again – "EC" and "HEAT" will appear on display.
- Using the (+) and (-) buttons adjust the set-point temperature limit for heat in economy mode. (Range 5...15°C, default 15°C)

The set-point temperature limit for heat in EC mode cannot be adjusted higher than the set-point temperature limit for cool in EC mode.

Adjusting offset temperature to calibrate room temperature readings (when needed)

- Press the ALARM LIMITS button again – "t" will appear on display.
- Using the (+) and (-) buttons adjust the offset. (Range -6…+6°C, default 0°C)
- Press the ALARM LIMITS button again to return to normal display.

- Press the ALARM LIMITS button again to return to normal display.

Temperature Sensors

Connection of External Sensor

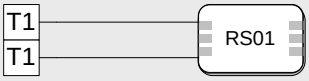
Installation procedure

- Disconnect power to the thermostat.
- Move JP1 to "B" position and connect the sensor to the T1,T1 terminals.
- Reconnect power.

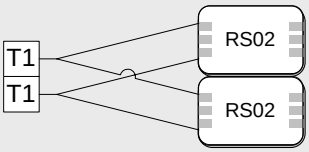
Important: The sensor must be SCI type.

Installation options

Connection of one sensor (TS01)
(Supplied with a fix 80cm cable)



Connection of one decorative room sensor (RS01)
(Cable is not supplied. See length limitations below)



Connection of two decorative room sensors for average measuring.
(Must be RS02 type only!)

Installation notes:

- Standard cable length for RS01 sensor - 100 feet (30 meters).
- Maximum length for Shielded Cable - Up to 300 feet (90 meters).
- Shielded Pair Wire (22 AWG) must be connected acording to the specifics of the unit!!!
- At 600 Feet, resistance could be affected resulting in fault temperature readings.
- The cable must not pass by or be close to any High Voltage Lines or Devices.
- Disconnect power to thermostat before installing the sensor.
- Do not install on external walls
- Keep sensor from any heat source (cooking kitchens, direct sun etc.)
- Do not install near or around wall openings (e.g. windows, entrance doors etc.)
- Do not block air flow to the sensor.
- An optimal wall mount installation for sensor will be 1.5 m from the floor.

NTC Sensor: Temperature ~ Resistance Characteristics

Temperature (°C)	7.2	10.0	12.8	15.6	18.3	21.1	23.9	26.7	29.4	32.2
Resistance (KΩ)	115.8	100.9	88.1	77.1	67.7	59.6	52.5	46.4	41.2	36.6

Connection of Outdoor Sensor

The outdoor sensor comes with a weather-proof hermetic case.
Connect the outdoor sensor to the T0,T0 terminals on the thermostat - the polarity is not important.
The outdoor sensor is optional and can be purchased separately.

Please consult the installation notes above before connecting the sensor.

Connection of External Receiver

This option will give you the convenience of changing the settings of your thermostat not only from the thermostat itself, but from other locations, such as Garage, Office, and Bedroom. More than one external receiver can be connected in daisy chain.
Connect the external receiver to the thermostat using a 3 wires shielded cable. Connect the cable to the 14,15,16 terminals on the thermostat and the receiver.
The shield must be connected to terminal 16.

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